heart reduction dose when comparing ABC to FB. Analysis was performed with BIOPLAN (BiOlogical evaluation of PLANs) PC based user-friendly software (evaluation of Dmax, Dmin, Dmean) and home-made Planning Reporting Orienteering (PRO)-DVH software. PRODVH produced Bio-DVH (Equivalent Dose Volume histograms for 25 fractions) that allowed the comparison regardless of the treatment schedule and that were used to calculate the average DVH for each set up. Secondary endpoints included dose reduction to the lung and procedural success rate.

Results: Between May 2012 to February 2015, 50 patients with LBC are selected for receiving RT using ABC after both FB and ABC simulation. Procedural success was good, all patients have sufficient compliance and are been selected for this procedure. The primary endpoint was achieved: use of ABC reduced LAD/heart exposition ($p < 0.01$ T-student test). There was no significant difference between the free-breathing and moderate deep inspiration breath-holding in the target volume coverage. The volume of the ipsilateral lung in the free-breathing technique was smaller than the moderate deep inspiration breath-holding techniques. All these data were confirmed with both software.

Conclusion: ABC was well tolerated and significantly reduced heart/LAD dose without impairment in target volume coverage. No difference was find in lung dose reduction. Use of the ABC device during RT should be considered to reduce the risk of ischemic heart disease in populations at risk.

EP-1196

Atlas-based segmentation for delineating the locoregional node levels during breast radiotherapy

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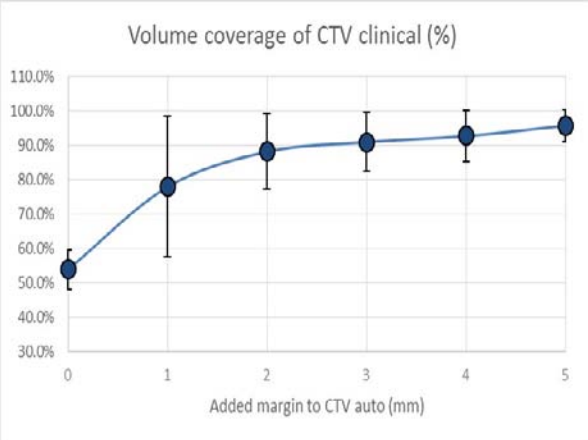
Purpose or Objective: Proper multi-atlas automated delineation can streamline clinical routine only when the proposed volume determination reasonably approximates the manual delineation. In this investigation we aimed to evaluate the automatic atlas-based segmentation of supraclavicular and level 3 lymph nodes for loco-regional irradiation of breast cancer. Further analysis were performed on the final plan's dose coverage to the automated clinical target volume.

Material and Methods: Between June and September 2015 five consecutive breast cancer patients with clinical indication for loco-regional irradiation were selected. Pre-defined breast delineation atlas of Mirada RTx (version 1.6.2, Mirada Medical, Oxford, United Kingdom) software were used to generate automated clinical target volumes (CTVauto) including the supraclavicular and the axillary level 3 lymph nodes. Responsible radiation oncologist delineated the reference CTV (CTVref) for each individual patients as well. Comparison metrics of Dice similarity (DI) and commonly contoured volume (CCV) were used. Furthermore the CTVauto was expanded with 1,2,3,4 and 5 mm uniform margin consecutively followed by an evaluation of the volumetric coverage of CTVref. Finally clinical plans were created expanding CTVref with 5 mm uniform margin using either direct antero-posterior beam or multi-beam IMRT. Dose coverage of the 95% of prescribed dose (V95) were compared for both CTVs.

Results: The average CTVref was 35.1 cc (Standard deviation = 10.2), while for the CTVauto 42.1 cc (SD = 12.1). Mean DI and CCV were 0.73 (SD: 0.26) and 0.72 (SD: 0.28) respectively. Expanding the CTVauto up to 5 mm in 1 mm increments covered the CTVref with 53.9%, 77.9%, 88.1%, 90.9% , 92.7% and 95.7% respectively. (Figure 1). For two patients single direct ante-posterior (AP) beam were used for the loco-regional treatment, while for the other three cases 6 beam IMRT were used. Average V95% dose coverage of CTVref was 98.5% (SD: 3.0) which lowered to 92.0% (SD: 9.1%) for CTVauto. For the two patient with single AP field the CTVref were 93.0% and 99.5%, which dropped to 79.8% and 99.4% for CTVauto. The multi-beam IMRT cases showed 100%, 99.9% and 99.8% CTVref_V95 and 100%, 88.5% and 94.0% CTVauto_V95.



Conclusion: CTV delineation using an atlas-based auto-segmentation shows promising results even in a small complicated volume delineation such as the loco-regional lymph nodes of breast. Further improvement of the delineation accuracy is expected by adding more cases to the initial multi-atlas (with 3 provided cases).

EP-1197

Hypofractionated radiotherapy in locally advanced breast cancer

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Purpose or Objective: Locally advanced breast cancer (LABC), clinically classified as cT4, is mostly identified in elderly patients, typically featuring unfavorable prognosis. It is usually associated with ulceration, bleeding and local pain, with prolonged course. Radiation therapy (RT) shows an important role in local control and symptomatic control. Hypofractionation radiotherapy scheme, with a dose of 13 Gy in two fractions with an interval of 48 hours (also known as RT-FLASH), allows acceptable results. With this study we aim to evaluate the response of the patients treated with RT-FLASH.

Material and Methods: LABC patients treated from 2001 to 2015 with RT-FLASH were retrospectively included. Local response was clinically assessed. Kaplan-Meier method was used for locoregional progression-free survival (LPFS) and overall survival (OS) analysis. Type I error of 0.05.

Results: 63 patients were included, with a median age of 78 years (39-92 years), 61.9% with Karnofsky≤80% and median progression time of 13.5 months (2-180 months). Carcinoma not otherwise specified (NOS) was the most common histological type (84.1%), with estrogen receptor-positive in 71.4%. Most of the tumors were cT4b (50.8%) and cT4c (36.5%) with cN+ in 60.3% and cM1 in 44.4%. At the initial evaluation 46.0% had bleeding injuries. Two RT-FLASH were performed in 65.1% of the patients. During treatment there was no record of toxicity. There was reduction of bleeding (81.5%), size (69.8%) and ulceration (39.6%). Surgical conditions were acquired in 23.8% of the patients. Patients cM1 received chemotherapy more often than cM0 (57.7% vs. 17.6%; p=0.001). Of the 63.9% patients that received hormone therapy (HT), 77.5% had 2 RT-FLASH (p=0.002 vs. non-HT), with a greater dimensional reduction in patients undergoing HT (81.1% vs 43, 8%, p = 0.010). LPFS at 2 and 5 years was 76.6% and 66.1%, respectively. The 2-year OS was 39.7% and 5-year OS was 19.5%, higher in cM0 patients (p<0.001), patients subjected to 2 RT- FLASH (p=0.003), or under HT (p=0.001). Multivariate analysis showed significant